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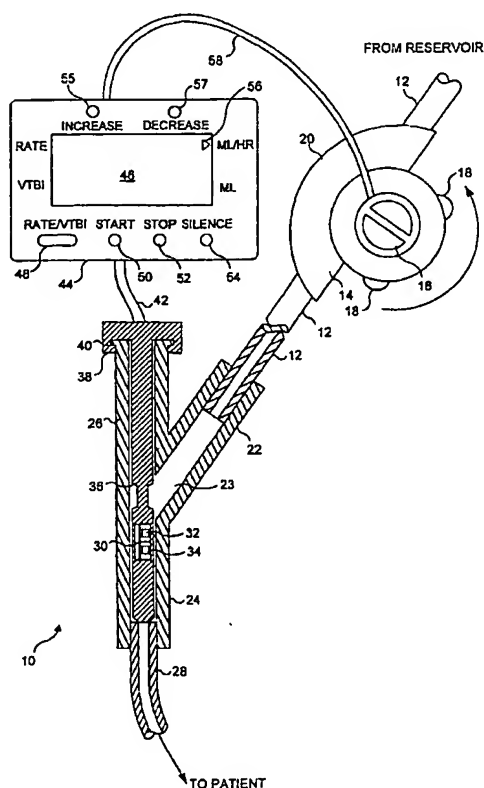
(43) International Publication Date  
7 February 2002 (07.02.2002)

PCT

(10) International Publication Number  
**WO 02/009795 A3**

- (51) International Patent Classification<sup>7</sup>: **A61M 5/172**, 5/168 (74) Agents: **WOODWORTH, Brian, R et al.**; Dept. 377/AP6D-2, 100 Abbott Park Road, Abbott Park, IL 60064-6050 (US).
- (21) International Application Number: **PCT/US01/23782**
- (22) International Filing Date: **27 July 2001 (27.07.2001)** (81) Designated States (*national*): **AU, CA, JP.**
- (25) Filing Language: **English** (84) Designated States (*regional*): **European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).**
- (26) Publication Language: **English**
- (30) Priority Data: **09/628,846** **31 July 2000 (31.07.2000)** **US** Published: **— with international search report**
- (71) Applicant: **ABBOTT LABORATORIES [US/US];** Dept. 377/AP6D-2, 100 Abbott Park Road, Abbott Park, IL 60064-6050 (US). (88) Date of publication of the international search report: **29 August 2002**
- (72) Inventors: **CHO, Steven, T;** 379 Regency Circle #305, Salinas, CA 93906 (US). **CLARK, Gene, E;** 3714 Red Oak Way, Redwood, CA 94061 (US). *For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: **CLOSED-LOOP FLOW CONTROL FOR IV FLUID DELIVERY**



(57) Abstract: In a closed-loop process, a controller uses a flow sensor to monitor the flow of a medicinal fluid being infused into a patient, to achieve a desired rate of flow. A relatively inexpensive peristaltic pump or electronically controlled valve can be used to vary the flow of the medicinal fluid through a fluid line. A Y site within the fluid line includes an integral flow sensor having an orifice. The flow sensor includes proximal and distal pressure sensors disposed on opposite sides of the orifice to monitor the distal and proximal pressure, producing a signal indicative of the rate of flow of the medicinal fluid through the fluid line. A signal produced by the controller is input to a motor driving the pump or to the valve to vary the rate of flow as required to achieve the desired infusion rate of the medicinal fluid.

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## INTERNATIONAL SEARCH REPORT

International Application No

PC1/US 01/23782

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 A61M5/172 A61M5/168

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 278 085 A (SHIM NORM) 14 July 1981 (1981-07-14) abstract column 6, line 49 -column 7, line 52; figures 1,3,6 ---	1,10-12
A	US 4 443 218 A (DECANT JR. ET AL.) 17 April 1984 (1984-04-17) abstract column 3, line 61 -column 4, line 18 column 7, line 48 -column 8, line 41; figures 1,2 ---	1-23
A	US 4 919 596 A (SLATE ET AL.) 24 April 1990 (1990-04-24) abstract column 3, line 56 -column 4, line 2 column 10, line 41 - line 55; figures 1,2 --- -/--	1,10-12

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

11 February 2002

Date of mailing of the international search report

18/02/2002

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 01/23782

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 4 447 224 A (DECANT JR. ET AL.) 8 May 1984 (1984-05-08)</p> <p>-----</p>	

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/23782

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4278085	A	14-07-1981	EP 0041559 A1 WO 8101656 A1	16-12-1981 25-06-1981
US 4443218	A	17-04-1984	NONE	
US 4919596	A	24-04-1990	CA 1324935 A1 DE 3880449 D1 DE 3880449 T2 EP 0319267 A2 JP 1297076 A JP 2801617 B2	07-12-1993 27-05-1993 02-12-1993 07-06-1989 30-11-1989 21-09-1998
US 4447224	A	08-05-1984	CA 1192464 A1 DE 3333977 A1 GB 2127179 A ,B JP 59075055 A	27-08-1985 22-03-1984 04-04-1984 27-04-1984